DESIGNING EDUcards AS VISUAL AIDS OF PROCEDURE TEXTS FOR STUDENTS WITH AUTISTIC SPECTRUM DISORDER

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Abstract

This research is aimed to design EDUcards; the visual recipes of West Kalimantan Traditional Cuisine, as learning medium of procedure texts teaching in the classroom of year-9 autistic students. This developmental study was conducted to bridge the gap between desired and actual performance of procedure texts teaching and learning caused by the limited availability of supporting media in the West Kalimantan Autism School. There were three phases of ADDIE procedure implemented during the process of creating EDUcards namely Analyzing, Designing and Developing phase. To decide the perceived quality of EDUcards, an assessment rubric consisted of twelve traits was being provided. It was used by the expert to validate the acceptability of EDUcards as visual aids in the procedure texts teaching learning. The result of assessment rubric indicated that EDUcards have met both teacher and students expectation, and are reliable to support the teaching learning process of procedure texts for ninth grade autistic students.

Keywords: EDUcards, visual aids, visual recipes, procedure texts, autistic students.

INTRODUCTION

Interventions to support the individuals' educational settings typically include the use of a wide variety of visual aids since these tools are possible to benefit the students, and can be applied almost in every circumstance, and part of language teaching material (Hayes et al., 2010). These artifacts are used along the process of teaching and learning to both encourage, and represent messages. Moreover, visual aids can also be used by the students with ASD; stands for Autistic Spectrum Disorder (Ministry of Education, 2007), with limited verbal communication skill, to enhance the process of building social interaction, and augment the communication process itself. Unlike spoken words which are inconsistent and barely last for a fleeting moment, visual aids are able to offer consistency in the process of information transferring.

Generally speaking, ASD is complex neurological disorders, which constantly prevent somebody to experience an enhancement of certain abilities and skills (Simmons, 2006). Autism itself is not a kind of mental illness, but 'neurologic disorders', which precludes its sufferers from having a social communication, constrained interests over something and are likely to perform recurring patterns of behavior (Simmons, 2006). Moreover, Simmons (2006, p. 3) stated that autism "is associated with delayed or absent spoken language, and sometimes with cognitive delay." Autism typically emerges during the first three years of life which occurs in approximately 1 out of every 150 children (Simmons, 2006). It is categorized by the series of impairments which are being performed in social communication and interaction. Moreover, the characterization also can be done by observing the peculiarity of behaviors, interests, and commotions of the sufferers (Ministry of Education, 2007).

In actual teaching and learning process, students with ASD often times failed to comprehend verbal cues that are expressed by the caregiver as what have been experienced by the ninth grade students of

West Kalimantan Autism School. Generally, it is hard for autistic students to understand long form of instructions, and sequence of verbal information. Thus, the presence of visual supports as cognitive tools again, are needed in order to assist the academically activities, and help diminishing series of problems that are possibly arisen in the classroom setting of autistic students.

Students with ASD are having impairments in initiating the process of social communication, and are unable to perform best in several cognitive functions particularly when it has to do with abstract thinking and language (Saskatchewan Education, 1999). Moreover, they are having issues with focus and attention (Ministry of Education, 2007). Autistic students was easy to physically, and emotionally get distracted by things happening around them, and it takes time for them to engage with the learning practice if it is not worthy of note

Providing media as an intervention in EFL teaching and learning of autistic students is one of the effective ways to do since this input can be used to aid comprehension of verbal speech given, and motivate them in learning the non-native language. Media is a channel of communication that can be used to provoke discussion, and reinforce the autistic students' to engage with the learning ("Why Use Media," 2012). Moreover, Oroujlou, (2012, p. 24) believed that "…media language is true to life and is an important source to get information about the society and culture of target language." It offers EFL teachers and learners the opportunities to ease the burden of language learning. Above all, the autistic students will be able to have both cognitive and affective experiences through the use of media ("Why Use Media," 2012).

According to Hodges et al. (2006), visual aids are things we see in everyday life such as body language or natural cues that can augment the communication process. When drafting a design of visual aids, it is way more important to consider presenting the information in a simple visual format that can be easily understood by the autistic students. It has to be that effective in which the students can recognize, and comprehend the relation between the visuals and the intended message. Moreover, in order for the visual aids to successfully support the students' learning, they must be equal with the level of students' comprehension (Ministry of Education, 2007).

Cohen and Sloan (2007) briefly describe about six features that have to be considered in the process of making visual aids for students with autism. They are as follows: (1) Types of photos or pictures. There are several types of photos or pictures that are generally used by the teachers in helping autistic students with their learning. The first one is real objects, the second one is photographs, the third one is life-like drawings, and the last one is symbolic drawings (Cohen & Sloan, 2007). Cohen and Sloan (2007) mentioned that to select a type of photos, or pictures which matches the students' age or cognitive abilities, the students must get an exposure of each type above then show their responses to those alternatives. The feedbacks given by the students later will be a parameter which corresponds to the process of selecting the best option of photos or pictures for the visual products; (2) Durability. Visual aids ought to be durable enough for being used because the students can be rough with the tools (Cohen & Sloan, 2007). Moreover, they should be able to withstand water damage or food stains as well. Cohen and Sloan (2007) suggested that laminating is one of possible ways which can be done to make the visuals waterproof, and less resistant to tearing. Since the students will get along with the visuals throughout the school day, it is wise to choose plastic, paper, or foam as the material for the products. Those are harmless, and are not excessive to handle; (3) Portability. The visual supports must initiate less trouble to the students' mobility and ability in using the tools (Cohen & Sloan, 2007). Thus, it is

an advantageous option to create portable and smaller visual aids that will not force the students to stay in one place when using the aids; (4) Clarity. To provide good visual aids means to be clear. The aids constructed have to be able to initiate positive responses from the autistic students. Moreover, they must be salient as well, so the student can obviously respond to the aids in the manner expected (Cohen & Sloan, 2007); (5) Age appropriateness. It is important to make sure that the visual aids are fitting to the age level of the students, especially when the students are eight and above (Cohen & Sloan, 2007). Moreover, by the time being, appearance matters most. The students believe that they are more likely to be accepted by their surroundings if they are having the items that generally used by the communities (Cohen & Sloan, 2007). Besides, Meadan, Ostrosky, Triplett, Michna and Fettig (2011) claimed that the students' cultural and social acceptance must be put on the first place when choosing a visual aid; (6) Response effort required. The aim of designing visual aids is to make life easier. Hence, the supports must be trouble-free in which they do not demand the autistic students to make a good deal of extra effort when using them (Cohen & Sloan, 2007).

Based on the result of the pre-observation interview with the teacher of grade nine in West Kalimantan Autism School, the researcher found out that there was a need of more supporting teaching media related to procedure type of texts as mandated in the curriculum of 2013 that the school used. It showed that the students were hardly to understand the use and the organization of a procedure text because the cognitive tools that could support their learning were insufficient. Thus, the researcher designed *paper-based cards* named EDUcards as the visual aids in order to help overcoming this problem. Unlike the visual aid designed by Hodges et al. (2006) namely *Sense Cam* which is more sophisticated, EDUcards were constructed by the researcher based on low technology aided Augmentative and Alternative Communication (AAC) Systems, as a consequence of the lack presence of computing devices in West Kalimantan Autism School. Speech Pathology Australia (Clinical Innovation and Governance, 2016) defined Augmentative and Alternative Communication Systems (AAC) as a clinical and educational system which provides interventions of communication for helping individuals who have impairments in building social interaction, and complex communication needs (CCN). AAC intends to provide people with CCN a means of independent communication, and improve their ability to productively contribute in the society (Iacono, Lyon, West, & Johnson, 2013). These systems are really of use in which the autistic students can utilize them to build social interaction.

EDUcards are visual recipes whose construction is nearly similar to flashcards. EDUcards were being used to teach autistic students about procedure texts discussing the ways of cooking traditional menus from West Kalimantan namely fried banana with coconut egg jam, and iced mixed fruit with sweetened condensed milk. EDUcards were invented not to force the ideas of learning grammar to the students, yet merely help them in understanding the verbal information through visuals. These aids could provide the students an effective way of quickly grips with the content, and goals of procedure texts by encouraging them to think in pictures (Grandin, 1995).

The research conducted by Grandgeorge and Masataka (2016) addressed an issue dealing with color preference of students with ASD. As reported in the study, the most preferred color of ASD students was red; blue was close to it, and then yellow followed (Grandgeorge & Masataka, 2016). In this research, the shade of EDUcards was blue, as it was one of the three most preferred colors decided by the ASD students (Grandgeorge & Masataka, 2016). Moreover, the used font was Garamond with the size of 30pt; almost two times bigger than the ideal size commonly used in large

print document which is 18pt (Northern Ireland Assembly [NIA], 2018). Garamond itself is one of the most preferred theme fonts selected by the autistic people for easy read (NIA, 2018).

METHOD

There are numerous types of research studies that could be conducted by the researchers. In carrying out this research, the researcher decided to conduct a qualitative developmental research. Richey and Klein (2005) stated that a development research is a type of research study which focuses on the design, development, and the evaluation.

This research was conducted in West Kalimantan Autism School on the ninth grade students of the first semester in academic year 2017/2018 with the aim of developing EDUcards as visual aids that can support the teaching learning of procedure texts. The subject in this research was the teacher of grade nine students.

In this research, the researcher included one of Instructional Design (ID) namely ADDIE procedure, which consists of five phases namely analyzing phase, designing phase, developing phase, implementing phase, and evaluating phase (Branch, 2009). However, there were only the first three phases of the ID being used: analyzing, designing, and developing phase.

In the first phase namely analyzing phase, the researcher conducted a structured interview with ten open-ended questions to get the information needed since it can be used to reduce the possibility of bias, and facilitate the organization of data being collected (Cohen, L., Manion, L., & Morrison, K., 2000). In the next phase which is designing phase, the researcher began to draft the initial design of EDUcards. The researcher also held a documentary study. This technique could effectively help the researcher to find out the data about things or variables which were needed from various sources such as books, articles, transcripts, or internet.

In the developing phase, the researcher started to construct the products based on the design being made. Moreover, once the prototype of the products was done developed, the researcher then managed a validation, and handed an assessment rubric to the teacher. By using the assessment rubric, the researcher could decide the perceived quality of the products.

In measuring the teacher's attitude towards the products, the researcher involved the use of Likert scale where the teacher was offered a choice of five coded responses with the neutral point being neither strongly agree, nor strongly disagree. The use of the scale allowed the teacher to straightforwardly judge the quality of EDUcards by merely selecting one number of its coding frequencies.

To analyze the result of the assessment rubric, the researcher used rating scale which was adapted from Harry Walker (as cited in Rahman, 2017) with the formulae as follows.

$$\boldsymbol{P = \frac{result\ score}{amount\ of\ point \times amount\ of\ categories} \times 100}$$

$\boldsymbol{P}$ = **Percentage**

To provide the result of the above calculation in a qualitative manner, it could be determined according to the table below.

Table 1. the Level of the Expert's Perceived Products Quality

Percentage (%)	Interpretation
0 – 25	Bad (revise)
26 – 50	Poor (revise)
51 – 75	Good
76 – 100	Very Good

(from Harry Walker as cited in Rahman, 2017)

FINDINGS AND DISCUSSION

Findings

West Kalimantan Autism School is one of four Licensed Extraordinary Schools

in Pontianak. The school was built three years ago sponsored by Anggito Pramestyo Foundation, and officially got its operational permit a year later. This private school is located in Tanjung Raya II, East Pontianak. There are only six classrooms being occupied since the rests are under construction, and there is neither computer laboratory, nor library, not to mention the internet access.

There are only two students of grade nine in West Kalimantan Autism School. From the structured interview conducted by the researcher with the teacher, it is known that both of them are experiencing moderate to severe impairments of ASD in which they cannot easily get engaged in social interaction, and often being distracted by the surroundings during the teaching learning process. Besides, they are having difficulties in controlling their emotion.

During the process of learning procedure texts, the students had experienced difficulties. The complex instructions written on the texts often times make the students confused. Moreover, none of them has a similar way of learning, thus the teacher provided different type of learning technique for each. However, the approach being used was the same for those two namely the visual approach. Visual approach involves the use of visual aids in the process of teaching and learning. Those aids can attract the students' attention, and help them understanding the material being taught especially about procedure texts. As what has been discussed with the teacher during the interview, teaching procedure texts to the autistic students is uneasy. Procedure texts provide series of drawn-out instructions in which the autistic students cannot completely understand. Autistic students are having deficits in interpreting complex information. Hence the teacher needs visuals as the supporting tools to help the students in learning procedure type of texts.

Visual aids enable the students to think of complex and abstract ideas in pictures, which is more comprehensible for them. Moreover, visual aids can persuade the students to focus on the learning, and maintain students' attention towards the course being studied. However, the availability of visual aids especially in procedure texts teaching and learning was limited. The teacher did need more supporting tools especially the visual one to facilitate and encourage the students in the learning practice of that type of texts. Since there is an absence of internet connection, and computer laboratory service in the school, the researcher then decided to design low tech visual aids namely EDUcards for teaching procedure texts of West Kalimantan traditional cuisine to the autistic students of grade nine in West Kalimantan Autism School.

The prototype of EDUcards itself consisted of four main different items namely a paperboard box as the package, poster describing ingredients needed, deck of cards displaying series of directions, and a user manual. The dimension of printed EDUcards is 9 x 5.5 cm (the finished cards size) with 0.5 cm of the bleed area (an extra space provided for the additional design elements or backdrops that wider than the finished size of the cards). Each card of EDUcards displayed colorful life-like pictures and several standardized symbols which were referred to the systems of AAC. The pictures and the symbols were placed in a row, from the left to the right, to represent the steps of a procedure text. Besides, these cards were made of laminated art papers since autistic students, in any times, can be not so gentle with the cards. Moreover, paper-based cards are harmless for the students, and not too much to handle (Cohen & Sloan, 2007).

In this research, the researcher distributed an assessment rubric consisted of twelve different traits related to the six aspects that have to be considered in designing good visual aids. Moreover, the teacher was offered with five coded responses reacting to the traits provided in the assessment rubric. As soon as the

teacher had finished assessing the products, the researcher began summing up the scores given by the teacher in which the higher the total score is the better.

Table 2. The Result of the Assessment Rubric

	Trait	Score
1	Creativity	4
2	Skill	4
3	Neatness	4
4	Artistry	4
5	Content	5
6	Layout	4
7	Text Size	4
8	Colors	4
9	Grammar and Spelling	5
10	Durability	4
11	Portability	5
12	Safety	5
	Total Score	**52**

On the above description, the cumulative score of the assessment rubric is 52 of total point 60. In order to find out the perceived quality of EDUcards, the researcher then analyzed the total score achieved using rating scale formulae which is adapted from Harry Walker (as cited in Rahman, 2017). The analysis is as follows.

$$P = \frac{result\ score}{amount\ of\ point \times amount\ of\ categories} \times 100$$

$$P = \frac{52}{5 \times 12} \times 100$$

$$\boldsymbol{P = 86.66\%}$$

From the calculation displayed above, the average score of the assessment rubric on EDUcards is 86.66%, which is categorized as "Very good". Therefore, there is no urge to conduct a formative revision towards EDUcards since the quality performance of these visual aids have met the expert's expectations.

Discussion

Providing visual aids as interventions in the classroom can effectively improve the teaching and learning process especially of autistic students, since these aids are able to root students' participation in the lesson being taught (Shabiralyani, Hasan, Hamad, & Iqbal, 2015). The year-9 students and the teacher of West Kalimantan Autism School determine the visuals as a positive contribution to their learning, indeed. However, during the process of analyzing phase conducted by the researcher in the targeted school, the researcher found out a gap performed by the students in the procedure text learning. The gap was triggered by the unavailability of visuals that could facilitate the autistic students in learning this type of texts. Therefore, In line with the primary cause of the performance gap being found in the analyzing phase of this developmental study, the researcher decided to design visual recipes namely EDUcards; referred to the six aspects of designing good visual aids introduced by Cohen and Sloan (2007), as visual supporting media of procedure texts teaching and learning.

There were six aspects being observed during the process of designing the products namely types of photos or pictures, durability, portability, clarity, age appropriateness, and response effort required (Cohen & Sloan, 2007). Since the ninth grade students of West Kalimantan Autism School were above fifteen, life-like drawings could be used as visuals to initiate the process of learning (Cohen & Sloan, 2007). Moreover, EDUcards were constructed using laminated art papers with a size of nine by five point five (9 x 5.5) centimeters long which made them possible to withstand the water damage, and were easily to be carried or moved (Cohen & Sloan, 2007). Besides, EDUcards were completed with brief and clear instructions, and the course content that the students can engage easily with.

Managing an expert validation in a development research is somehow extremely important. This professional judgment can be used to describe the content, generate the sample, and decide the

scoring system (Berk, 1990). Hence, to describe the universe of content, and observe the perceived quality of EDUcards, the researcher conducted an expert validation by distributing an assessment rubric consisted of twelve traits and five coded responses to a practitioner who was the ninth grade teacher. The traits were organized based on six criterions of good visual aids as what have been suggested by Cohen & Sloan (2007).

According to the analysis on the result of assessment rubric, it was confirmed that EDUcards have been categorized as "Very good" (***See table 1***) visual aids with an average score 86.66% of 100%. It indicates that EDUcards are applicable to be used as visual aids during the procedure texts teaching and learning of ninth grade autistic students in West Kalimantan Autism School. Moreover, EDUcards are also completed with a brief and clear user manual in which this document is intended to give assistance to the teacher and the students in using the products.

CONCLUSION AND SUGGESTION

Conclusion

The researcher decided to develop EDUcards in view of the fact that there was a performance gap exhibiting by the ninth grade students of West Kalimantan Autism School during the procedure text learning. The major cause of the gap was the limited number of supporting media that could be used by the students in learning procedure texts. The visual recipes constructed by the researcher were focus on discussing about two West Kalimantan traditional cuisines namely fried banana with coconut egg jam, and iced mixed fruit with sweetened condensed milk. Both of the dishes were being visualized through life-like drawings, and symbols. The cards were also completed with clear instructions placed beneath the pictures, and the symbols. Moreover, to help the teachers in using the products, the researcher provided a booklet detailing about teacher's manual, and handout. Above all, based on the research findings observed by the researcher, it is believed that the two aspects being questioned on this developmental study have been completely answered. The visual aids being developed namely EDUcards have met both the teacher and the autistic students' expectation, and were feasible to be used in the process of procedure texts teaching and learning in West Kalimantan Autism School. Moreover, the manual and handout provided could help giving assistance to the teacher and the students in using the products.

Suggestion

The teacher needs to design, and develop more visuals on another aspect of learning material since the students are having deficits in interpreting abstract or complex information, not to mention drawn out verbal cues. The autistic students can be less – motivated in learning at times. Thus, the teacher must be able to encourage the students with positive reinforcements by exposing them to game plays, and arts. Moreover, it is important to the teacher to recognize the character of each student in order to provide an effective stimulation. Above all, there are only minimal numbers of studies conducted on the teaching learning of students with ASD that have been published. Hence, it is advisable to uphold more research regarding their development, and teaching learning technique.

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